

ELEC 261 -- SYLLABUS

Electronic Materials: An Introduction to Quantum Devices

Course Objective

This is an introductory course that focuses on the atomic-scale physics and chemistry behind the transport of electricity in materials and its fundamental role in modern electronic devices. While this course is primarily focused on the classical and quantum mechanical views of electron conduction in solids it will also include discussions on magnetism, superconductivity, and dielectric properties. It will not only cover past and current commercial processor and memory technology, but will also highlight the physics behind ongoing research in possible alternatives.

Course Outcomes

At the conclusion of ELEC 261, you should have gained an understanding of and perform quantitative calculations concerning

- electrical and thermal conduction in solids
- material structure and its importance on electronic and optical properties
- role of quantum mechanics in molecules, metals, & semiconductors

Instructor

Kevin Kelly

Brockman Hall 326, 713.348.3565, kkelly@rice.edu

Times and Places

Lectures: MWF 1:00-2:00pm DCH 1046

Owlspace: Elec 261 001 F16

OfficeHours: M 10-12 BRK 326, T & Thu 12:30-2:30pm BPV, & appointment

Required Text

J. D. Livingston, *Electronic Properties of Engineering Materials*, Wiley, 1999.

Grading

80% - 4 in-class exams

20% - Homework

Students are allowed to work in groups on the homework unless otherwise mentioned. On the homeworks, it is very important to SHOW YOUR WORK.

Homework assignments will be accepted late with a penalty of 10% per class period after they are due. Exams MUST be an individual effort and any violations of this will be considered violations of the Rice Honor Code.

Students with disabilities

Any student with a documented disability needing academic adjustments or anyone needing other accommodations is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Additionally students with disabilities need to contact Disability Support Services in the Allen Center.

{The information contained in the course syllabus may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.}